

Results of Competition: Drone Solutions for COVID-19: Innovate UK De Minimis Strand

Competition Code: 2005_UKRI_IDEAS_COVID19_DRONES_DEMINIMIS

Total available funding is £34,000,000 (from FFC Strand 1/2)

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

| Participant organisation names | Project title | Proposed project costs | Proposed project grant |
|--------------------------------|---|------------------------|------------------------|
| E2E SERVICES LIMITED | Beyond Visual Line Of Sight (BVLOS) Drone Communications Relay Technical Roadmap for COVID19 Multi-Function Operations | £107,987 | £107,987 |

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

A set of use cases identified for supporting the response to COVID-19 is addressable by BVLOS drone operations, including:

- 1\ Delivery of medical supplies and testing equipment remotely to patients.
- 2\ Collection and transfer of medical samples.

BVLOS operations requires communications for both Command and Control (C2) of the airborne platform and payload communications. This connectivity problem is challenging: drones are mobile; must operate autonomously from ground level up to 400' with buildings and terrain blocking and disrupting signals; in rural and urban areas; and require payload data rates in the Mbps range. Available communications networks have patchy coverage, available radio frequencies are constrained in bandwidth, power limits or both.

This investigation addresses a novel architecture to mitigate these challenges and so provide comms modules to enable suitably capable drones to deliver COVID-19 benefits. The work incorporates a design study using well-defined mission use cases. The output is a specification and roadmap for the required systems, ready for a subsequent design and build of BVLOS comms modules.

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| VTOL TECHNOLOGIES LIMITED | Repurposed Automated 20kg GTOW, 4kg Payload, Beyond Visual Line Of Sight [BVLOS] VTOL Flying Wing Drone for COVID-19 Multi-Function Operations. | £186,118 | £186,118 |

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Project description - provided by applicants

This is a highly innovative, dynamic project, striving to cut through "red-tape", supporting both strategic COVID-19 and additional NHS and local authority medical supplies-delivery goals with the ambition of manufacturing commercial systems and providing BVLOS drone services.

The aim of this project is to repurpose and scale up VTOL Technologies current BVLOS drone systems to enable 20kg unmanned drones with a 4kg active payload to fly long-range missions Beyond Visual Line of Sight [BVLOS], providing a truly flexible, multi-function, multi-operation drone, able to offer COVID-19 and beyond medical-supplies delivery services, for both congested urban and difficult-to-access rural environments.

The COVID-19 global pandemic threat with associated economic uncertainty and climate change, present risks to the health, well-being, and security of the UK population. This project is designed to tackle some of these risks by enabling safe, environmentally friendly, CAA certified, BVLOS drones with a capable payload, to address rapid-response, medical supplies delivery challenges that are becoming ever more problematic on the ground.

Our project will produce a 20kg BVLOS thrust-vectoring, VTOL flying wing design that once manufactured, will enable:

- 1.Delivery of medical supplies and testing equipment remotely to patients.
- 2.Collection and transfer of medical samples.
- 3.Surveillance and public order management.
- 4.Replacing field-based personnel for inspection and maintenance activities.

This high-performance BVLOS drone platform, when manufactured and operational, will contribute to keeping Britain moving, protecting the health of the nation and keeping workplaces operational.

The learning from the development of this project will also be used to inform the greater commercialisation of low-level airspace to support more flexible and sustainable medical supplies and test-sample deliveries remotely to patients UK wide.

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| MOTION ROBOTICS LIMITED | End to End logistic support tools for effective aerial drone delivery against COVID-19 | £195,100 | £195,100 |

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Project description - provided by applicants

As the usage of drones in the parcel delivery space gathers pace, many of the technologies required to fly drones have been solved to a large extent.

Already drones are impacting the delivery of medical supplies and high value urgent items such as we are doing in the Solent FMZ project preparing to fly cancer treatments between Portsmouth and the Isle of Wight.

However drones will only compete with humans and van delivery, if the systems are available to support all aspects of the end to end process, in particular when the drone is not flying.

Before and at the end of flights drones need to be handled to load cargo, remove cargo and perform maintenance.

While much emphasis has been placed on how the drone can fly safely and efficiently, very little work has focused on how parcels are loaded and delivered autonomously in such a way that the drones can function with greater functionality and autonomy.

For the past 9 months Motion robotics has concentrated its research in this area; to develop different automated cargo loading and unloading methods that will suit different real world needs such as field replenishment of medical products to pop up clinics in remote areas, autonomous collection of waste and automating warehouse parcel to drone interaction.

The key objective of the project is to build on our TRL5/6 solutions and take them to TRL9 levels such that at the end of the project we can begin deployment of our drones, in the field, and scaling up the service to meet the needs of COVID-19 rapid response as early as possible in 2021\.

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